

### **REMARKS**

The Examiner is thanked for the performance of a thorough search.

Prior to this amendment, Claims 1-26 were pending in the application. By this amendment, Claims 1, 4, 6, 8, 13, 15, 18, 20 and 22 are amended. No claims are added or cancelled. Hence, Claims 1-26 are currently pending in the application.

As a preliminary matter and as requested in the Office Action, substitute copies of pages 23 and 24 of the application as originally filed are submitted as an attachment hereto, to complete the Office's file record.

### **SUMMARY OF THE REJECTIONS/OBJECTIONS**

Claims 1-6, 8-13 and 15-26 were rejected under 35 U.S.C. § 101 as allegedly unpatentable subject matter; and Claims 1-26 were rejected under 35 U.S.C. § 102(b) as allegedly anticipated by "Concurrency and Coherency Control in Database Sharing Systems" by Rahm ("*Rahm*").

### **THE REJECTIONS NOT BASED ON THE PRIOR ART**

#### **Claims 1-6 and 8-13**

Claims 1-6 and 8-13 were rejected under 35 U.S.C. § 101 as allegedly unpatentable subject matter. Specifically, the question is raised as to whether these claims are directed to merely an abstract idea that is not tied to a machine and which would not produce a concrete, useful and tangible result.

Independent Claims 1 and 8 are amended to recite "[a] computer-implemented method ...". Therefore, the methods recited in Claims 1 and 8 are now explicitly tied to a machine. Furthermore, because the steps performed are computer-implemented, performance of the steps does transform physical matter to a different state. It is commonly understood that computer-

implemented steps operate on data stored in electronic computer memory; changing data causes a change in the state of cells, gates and transistors of the electronic memory; changing the state of these devices means, at the atomic level, that an electron charge is applied to certain semiconductor materials associated with particular memory bit locations and not to others; and that this change in charge is a concrete and tangible result. For these reasons, the rejection of Claims 1-6 and 8-13 is now moot. Withdrawal of this rejection of Claims 1-6 and 8-13 under 35 U.S.C. § 101 is requested.

#### Claims 15-26

Claims 15-26 were rejected under 35 U.S.C. § 101 as allegedly “intangible subject matter.” Specifically, the Office Action appears to be rejecting these computer-readable medium claims because embodiments recited in these claims include “light waves”, “radio waves” and “infra-red”, which the Action alleges are “intangible medium.” This rejection is traversed.

Articulation of the basis for this rejection is respectfully requested because it is submitted that there is no such “tangible medium” test for patentability.

Perhaps the Office Action is referring to a test for statutory subject matter according to which the subject matter claimed must be based on a “concrete, useful, and tangible result.” It is assumed that the Office Action is referring to the foregoing test, and the following remarks are based on that assumption.

First, a tangible result is clearly different than a tangible medium. Therefore, the test for a concrete, useful, and tangible result is misapplied in this instance. A tangible result is produced by the performance of the steps recited in Claims 15-26, regardless of whether the instructions for performing such steps are carried on a CD, for example, or a light wave, radio

wave, or infrared wave. It is the performance of the steps that produces the tangible result, not the medium that carries instructions for performing the steps.

Next, even if there was a legal basis for a tangible medium requirement, light waves, radio waves, and infrared waves are tangible. The fact that such wave types are computer-readable alone is dispositive evidence that the claimed wave types are tangible. It is inherent that if a computer can read the medium, it is a tangible medium. In other words, the medium is readable by a computer because of its physical properties. Furthermore, simply because the human visual system may not be capable of physically *seeing* such waves does not mean that they are intangible. If light waves and electromagnetic waves (e.g., radio and infrared) are produced and transmitted with enough energy and focus, a human could certainly physically *feel* the corresponding effect, as both types of waves are currently used, for example, in surgical procedures (e.g., LASIK eye surgery and laser-assisted uvulopalatoplasty, and radiofrequency-assisted uvulopalatoplasty).

Based on the foregoing, a computer-readable medium that may be embodied in light waves and within different frequency bands of the electromagnetic spectrum are clearly tangible medium, and clearly produce a tangible result. Therefore, withdrawal of this rejection of Claims 15-26 under 35 U.S.C. § 101 is requested.

#### THE REJECTIONS BASED ON THE PRIOR ART

Claims 1-26 were rejected under 35 U.S.C. § 102(b) as allegedly anticipated by *Rahm*. This rejection is traversed.

For a valid anticipation rejection, each and every feature of the rejected claims must be found in the prior art reference on which the rejection is based, or commonly known to one

skilled in the applicable art. *Rahm* does not disclose each and every limitation of Claim 1 and, therefore, does not anticipate Claim 1.

Claim 1 recites the following, with emphases added:

for each entity of said plurality of entities, maintaining, local to said entity, data that indicates whether any other entity of said plurality of entities has an exclusive lock on said resource;

for each entity of said plurality of entities that seeks to acquire a shared lock, ...

By contrast, *Rahm* discloses that entities maintain data that indicates whether *they themselves* have a lock on a resource. For example, FIG. 3 of *Rahm* illustrates that LLM1 of P1 maintains data indicating the type of lock that P1 has on object O2. However, LLM1 does not maintain data indicating whether any other entity holds a lock on O2. *Rahm* does not disclose that LLM1 maintains data indicating that P3 also holds a lock on O2. Similarly, *Rahm* illustrates that LLM2 of P2 maintains data indicating the type of lock that P2 has on object O1, but LLM2 does not maintain data indicating whether any other entity holds a lock on O1, or that P1 and P2 hold locks on O2. Another difference between *Rahm* and Claim 1 of the present application is that each entity recited in Claim 1 maintains data that indicates whether any other entity has an exclusive lock on the particular resource, even if the entity has no locks on the resource. In *Rahm*, the entities store resource lock data locally only if they have a lock on that resource.

Granted, LLM1 could infer from the fact that P1 has a shared lock on O2, that no other entity has an exclusive lock on O2. However, if that was the case, it does not make sense that P1 would be seeking to require a shared lock (as required in Claim 1) on O2 because it already has a shared lock on O2. Furthermore, LLM2 could infer from the fact that P2 has an exclusive lock on O1, that no other entity has an exclusive lock on O1. However, as already discussed,

LLM1 and LLM3 do not maintain lock data about O1, as would be required by Claim 1. If *Rahm* disclosed (which it does not) that LLM1 and LLM3 did maintain lock data about O1, then LLM1 and LLM3 would only maintain local lock state of O1. For P1 and P3, the local lock state of O1 would be a “no lock” (NL) state, which tells P1 and P2 nothing about whether any other entities have an exclusive lock on O1 (as required by Claim 1).

The Office Action states (page 5, near top) that the LLMs of *Rahm* process lock requests and releases locally without communicating with the GLM. With reference to that statement, the Office Action refers to Table 1 of *Rahm*, contending that it teaches that “read lock request (i.e., shared lock) is granted locally at LLM.” However, note that the read lock request is granted locally only if the local lock state is RA (read authorization) or perhaps WA (write authorization), which seems to mean that the node has already been given a shared or exclusive lock. Thus, the read lock request is not granted specifically based on whether or not an exclusive lock has been granted to other entities, determined from the local data that indicates whether any other entity has an exclusive lock (as required by Claim 1).

If P1, for example, was requesting a read lock for object O1, and *if* LLM1 was also maintaining local lock state for O1 (which is not disclosed in *Rahm*) in addition to local lock state for O2 (as shown in Figure 3), then the local lock state for O1 would be NL because P2 already has exclusive lock on O1. Hence, Table 1 explicitly illustrates that for a local lock state of NL, the entry “GLM” indicates that the node would be required to send a lock request message to the global lock manager to acquire the lock. That scenario is an example of the problem in the prior art that the embodiment recited in Claim 1 overcomes. Claim 1 recites that “if the data indicates that an exclusive lock has not been granted to any other entities..., then the entity acquiring said shared lock without receiving a lock grant from a resource master...” Significantly, the lock can be acquired without a request to the resource master because each

entity is maintaining data locally that indicates whether any other entity has an exclusive lock on the resource. As previously discussed, such a teaching is not disclosed or suggested in *Rahm*.

For all the foregoing reasons, *Rahm* does not anticipate Claim 1. Claims 2-7 depend from Claim 1 and are, therefore, patentable over *Rahm* for at least the same reasons as Claim 1 from which they depend. Therefore, withdrawal of the rejection of Claims 1-7 under 35 U.S.C. § 102(b) is requested.

Claims 15-21 recite computer-readable mediums that carry instructions for performing steps corresponding to the steps recited in Claims 1-7. Therefore, Claims 15-21 are patentable over *Rahm* for at least the same reasons as corresponding Claims 1-7. Withdrawal of the rejection of Claims 15-21 under 35 U.S.C. § 102(b) is requested.

Claim 8 recites the same first step as recited in Claim 1 (and repeated above in reference to Claim 1), regarding maintaining at each entity data that indicates whether any other entity has an exclusive lock on a particular resource. Therefore, due to the absence of such a teaching from *Rahm*, Claim 8 is patentable over *Rahm* for at least the same reasons as Claim 1. Claims 9-14 depend from Claim 8 and are, therefore, patentable over *Rahm* for at least the same reasons as Claim 8 from which they depend. Therefore, withdrawal of the rejection of Claims 8-14 under 35 U.S.C. § 102(b) is requested.

Claims 22-26 recite computer-readable mediums that carry instructions for performing steps corresponding to the steps recited in Claims 8-10, 12 and 13. Therefore, Claims 22-26 are

patentable over *Rahm* for at least the same reasons as corresponding Claims 8-10, 12 and 13.

Withdrawal of the rejection of Claims 22-26 under 35 U.S.C. § 102(b) is requested.

### CONCLUSION

For the reasons set forth above, it is respectfully submitted that all of the pending claims (1-26) are now in condition for allowance. Therefore, the issuance of a formal Notice of Allowance is believed next in order, and that action is most earnestly solicited.

The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

Please charge any shortages or credit any overages to Deposit Account No. 50-1302.

Respectfully submitted,

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Attachments: Copies of pages 23 and 24 of Specification as filed

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12 if no conflicting lock is being held by any other entity of the plurality  
13 of entities, then  
14 said entity acquiring said exclusive lock, and  
15 updating the data of the plurality of entities to reflect that an  
16 exclusive lock is being held by one of the plurality of  
17 entities.

1 23. The computer-readable medium of Claim 22 carrying instructions to cause the  
2 resource manager to allow the entity that seeks to acquire an exclusive lock to acquire  
3 that exclusive lock if no conflicting lock is being held by any of the entity of the  
4 plurality of entities.

1 24. The computer-readable medium of Claim 22, carrying instructions for indicating to  
2 the entity that is holding said exclusive lock that another entity of the plurality of  
3 entities is waiting for a lock when an exclusive lock is being held by any entity of the  
4 plurality of entities.

1 25. The computer-readable medium of Claim 22, carrying instructions for indicating to all  
2 entities that are holding a shared lock that an entity of the plurality of entities is  
3 waiting for a lock if a shared lock is being held by any entity of the plurality of  
4 entities.

1 26. The computer-readable medium of Claim 26 carrying instructions for causing each  
2 entity of all entities that is holding a shared lock, upon releasing said shared lock, to



- 3 indicates to said lock manager that the corresponding shared lock that is held by that
- 4 entity has been released.